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REFLECTIONS

ON THE

DURATION OF PREGNANCY,

WITH REMARKS ON THE

CALCULATION OF THE DATE OF CONFINEMENT.

BY

J. MATTHEWS DUNCAN, A.M., M.D., F.R.C.P.E.,

LECTURER ON MIDWIFERY, PHYSICIAN-ACCOUCHEUR TO THE ROYAL DISPENSARY,

ETC. ETC.

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ON THE

DURATION OF PREGNANCY.

IN the numerous elaborate essays which have been written on the subject of the duration of pregnancy in woman and in the inferior animals, it has always appeared to me that an important source of error has lain concealed. The exposition of it will, I trust, throw some light on this interesting subject; and I am sure that, when it comes to be completely investigated, our notions as to the duration of pregnancy will be much more definite and satisfactory than they now are. My object in the present communication is to make a few remarks on this particular point, and then briefly to discuss the general question.

In the beginning it will be useful to define the meaning to be attached to some important terms frequently recurring in this discussion, viz., insemination, conception, and impregnation. By the word insemination is to be understood simply the injection of semen into the genital passages, the conjunction of the two sexes. By conception is to be understood the more hidden and mysterious union of the semen and ovum; while the word impregnation implies both of these processes.

The confusion of the two former of these different processes is so general among obstetric writers, that it is needless to quote authorities for the assertion. That they should always be held distinct in studying this subject will, I hope, be made apparent. For, in fixing the commencement of pregnancy, it is necessary to date only from the period of conception. Authors, in discussing this subject, have delighted to quote as crucial examples those cases where the date of an only connection, or of connections within a short and limited time, could be satisfactorily decided. But it is evident that such a date only fixes the time of insemination, and not the time of the

commencement of pregnancy. For a woman cannot be said to be pregnant whose body merely contains scimial matter. Pregnancy is a state of fertility, of breeding, which, as Leeuwenhoek long ago pointed out,¹ cannot be said to commence until such time as may have elapsed after insemination, before the union of the ovum or ova and semen has taken place. This period of time, whatever may be its possible length, must be subtracted from all these supposed crucial cases of the duration of pregnancy. The interval described as the duration of pregnancy, that is, between sucessful insemination and partnriton, must be considered as, in strict language, a false period ; and it is so because it eontains the period between insemination and eoneception, during which a woman is not pregnant. Of this interval, then, all such cases must be curtailed.

Very little has as yet been ascertained as to the possible length of this interval. It was my intention to have attempted to make it out in regard to some of the lower animals; but my inexperience in such investigations, and the pressure of other avocations, have hitherto deterred me from the pursuit of this object. There is, then, at present no resource in this question but to facts already known. Now it has been ascertained by physiologists that for impregnation it is not necessary the semen should be newly expelled by the male.² Animals have been frequently impregnated, by Spallanzani and others, with semen, which has not only been kept for some time, but has even been variously altered, in mechanical properties at least, in experiments. And there seems to be no limit to the time during which the semen may be kept without losing its virtues, except the term of the life of the spermatozoa.

That this period is not insignificant, and cannot be passed over without risk of important error; in fact, that it may extend to many days or weeks, will appear from the following observations. We omit the facts in regard to animals so low in the scale as insects, in the females of which the semen is laid up in cavities where it retains

¹ Hinc, hæ animaleula diutius in tuba sive matrice posse vivere, animo præsumebam meo, ac quoque nostræ mulieres non prœiese eo die sive tempore, quo cum viro rem habuerunt, fecondas sive gravidas fieri; sed easdem post octo, aut decem, imo plures quidem dies, postquam eoverunt, gravidas posse fieri, quia post aliquot coitus dies ex multis saltem animaleulis, unum animalemnum eousque pervenire potest, ut punetum sive punetulum istud, animaleulum fovento aptum, attingat.—*Arcana Naturæ, etc., tom. ii. p. 150, edit. in 4to. Lugd. 1708.*

² “On opening the body of a female mammal, one or more days after it has received the male, semen may be found not only in the body and horns of the uterus, but also in the oviducts, and on the surface of the ovary. The spermatozoa are in vigorous movement. These may retain their activity for a week or more in the female organs. And in many insects this period of time is much greater. Here the ova are only expelled long after copulation. The females, therefore, possess a special receptacle in which the moving spermatozoa are preserved until the ova finally reach them. In this receptacle their activity remains uninjured for many months.”—*Valentin. Text Book of Physiol. Eng. Tr. p. 641.*

its power for months. In regard to the dog, Leeuwenhoek¹ pointed out that these animalcules might live for more than seven days preserved in a glass tube, and if such be the case in a rude experiment, it may be expected that they would retain vitality considerably longer in the passages of the bitch where they have heat and moisture supplied under favourable circumstances. That they do live for some days in the genital passages has been proved by abundant observations, although the possible length of this period is not certain. The decision, indeed, of this point by microscopic observations would be a very difficult matter, as it would involve the almost impossible search for spermatozoa over every part of a long tract of mucous membrane. And this search would be necessary, for we know by the experiments of Spallanzani, that semen highly diluted, or, in other words, the smallest quantity of semen is sufficient for successful impregnation.²

Again, the elaborate experiments of Haughton,³ long ago performed, show that in the rabbit conception generally does not take place till about fifty hours, or more than two days after insemination. He found that division of the fallopian tube earlier than this time prevented conception, and that, by waiting longer, the conception was not prevented by the mutilation. It thus appeared that the conjunction of the ova and semen in the rabbit generally did not take place till more than two days after insemination. In the rabbit, then, there was found in Haughton's experiments, this long interval between insemination and conception; and in some cases it is possibly much longer. In the rabbit the interval between insemination and parturition is ordinarily thirty days. The observations of Tessier upon 161 rabbits, give five days as the extreme limit of the protraction of this term, a period of time which may be accounted for without any stretch of the space during which the semen may retain its fructifying power. And in this way it may have happened that the real period of gestation, that is, from conception to parturition, may not have been at all protracted in these cases. The cases also in which the period was less than thirty days may be explained by supposing the ova to have been further matured or even advanced into the uterine horns before impregnation took place, so that conception may have happened very soon after insemination. And in Tessier's observations it is remarkable that in none of the rabbits did labour anticipate the usual time more than two days, the period which Haughton's experiments seem to show to be the usual interval be-

¹ "Si enim animaleula plures quam septem integros dies in tuba vitrea vivere possint, quantum temporis illa in matrice, his animalenlis recipiendis ac foventis nnice constituta, vivere quidein possent."—*Arcana nature, etc.* Tom. ii. p. 150.

² These observations of Spallanzani have lately been considerably modified and corrected, by the researches of Mr Newport upon the quantity or number of spermatozoa required to fecundate an ovum in the frog, etc.—See his paper in the London Phil. Trans. for 1853. Part ii.

³ *Philosophical Transactions.* 1797.

tween insemination and eoneception in this animal. In the present state of our knowledge, however, these explanations cannot be absolutely established.

Experiments of Cruikshank upon the rabbit and doe, experiments of Wharton Jones, Martin Barry and others, might be adduced as throwing light on this point.

For reasons which do not require to be stated, there is great deficiency of evidence in regard to the analogous subject in the human female. But there is every reason to believe that the circumstances of eoneception in her, closely resemble those in the higher animals. It has of late years been shown that, in woman, at every menstrual period an ovum is matured and expelled from its graafian vesicle, and that she is liable to conceive during its progress along the fallopian tube. How long after its maturation the ovum can retain its vitality and susceptibility to the seminal influence is not known, but probably the time is short. Nevertheless, cases might be easily adduced from the works of eminent obstetricians to prove that a single insemination at any period of the interval between two menstrual periods may result in the fertilization of the female. Of such cases those only are important in our present point of view where conception has resulted from insemination shortly before the return of a period. They admit of explanation in three different ways.¹ Either the ovum has remained up till this time entire and susceptible of being influenced by the semen, a supposition which is very improbable as regards the ovum,² and is at variance with what we know of the history of the decidua or nidus prepared for the egg's further development. Or, the excitement of connection may have hastened the maturation and rupture of a graafian vesicle, a view which is in itself improbable and inconsistent with what we know results from similar circumstances in the lower animals. But it may also happen that the seminal animalcules may remain in the passages till the ovum is prepared and discharged from its vesicle. An objection at once appears to this explanation, namely, that these spermatozoa would be removed by the menstruation contemporaneous with the discharge of the ovum. When menstruation does supervene on a single recent coitus, this will probably happen unless the semen have permeated the fallopian tubes, and thus advanced beyond the scope

¹ As a good example we may refer to a case of Dr Montgomery's (*Signs, &c.* of *Pregnancy*, p. 258.) The last menstruation was on the 18th October. Impregnation took place on the 10th November; parturition on the 17th August. The interval between insemination and parturition was thus 280 days; between last menstruation and parturition it was about three weeks more.

² "The passage of the ovum from the ovary to the uterus occupies, M. Bischoff says, three days in the rabbit and four or five days in ruminants, and therefore, probably eight or ten days in the human female. M. Bischoff believes that the ovum escapes from the graafian follicle at the time when the menstrual discharge is about to cease, and he is of opinion, that in order to be fecundated, it must be acted on by the semen while it is in the fallopian tube." —*Baly and Kirke's suppl. to the 2d vol. of Muller's Physiol.* p. 58.

of the menstrual flux. But the study of such cases as recorded by authors¹ reveals this interesting fact, that under such circumstances menstruation often does not take place at all, or only very scantily; the uterine system, as it were, anticipating the conception, and preventing the failure which might result from a free discharge of blood. It is evident that such cases occurring in married women would be very liable to be considered cases of gestation protracted a month.

THE INTERVAL BETWEEN INSEMINATION AND PARTURITION

Is a period of the greatest importance in a medico-legal point of view. It is discussed by obstetric authors as the period of gestation, or as the term of the duration of pregnancy. We have already shown that the present state of our knowledge requires us to make a distinction between the date of insemination and that of conception, and it strongly appears to us that the full comprehension of the bearings of this distinction will go far to equalize the discordant views as to the term of pregnancy in the human female, and to account for many of the so-called cases of prolonged gestation. But with our present ignorance of the possible interval between insemination and conception, the exact attainment of this result is impracticable.

In attempting to settle this point, authors have resorted to numerous sources of evidence, the fallacy of which they themselves well knew. For instance, we find Dr Montgomery in his classical essay on the period of human gestation, and many other authors, quoting examples based upon the evidence of peculiar sensations felt at the moment of conception, on the last appearance of the menses, and on the time of quickening, phenomena which, however important in aiding the accoucheur to make a good guess of the day of confinement in single cases, can never be for a moment relied upon in deciding such an exact question as that before us. An excellent story illustrating the fallaciousness of such evidence is related by Dr Reid, of an expert midwife who, when examined in the celebrated Gardner Peerage case, "deposed that she had once gone ten months with child, that she was always right in her calculations, that she always fainted away at quickening, etc., so that she could not be deceived."² Some time after the trial she applied to Dr Reid, convinced on such grounds that she was seven months pregnant. But on examination there was found no pregnancy at all.

No reliance can be placed but upon accurately ascertained dates of parturition and of fruitful connection. In regard to the latter of these dates, no confidence can be placed in the statements of women living habitually with males, however truthful they may be, or

¹ Maurieau (*Maladies des femmes grosses, obs. 676*) mentions a case interesting in this point of view, in which a woman was impregnated during the flow of menses!

² "Lancet," vol. ii. p. 78. 1850.

whatever additional evidences they exhibit. We are therefore reduced to a limited class of observations, namely, those where the pregnancy resulted from a single coitus, including those where this never took place but on a single day, and those where it was removed on both sides from other similar occasions by months, or such other period as would render it absurd to refer the parturition of a fully developed foetus to them. With those dating from a single day, we have included some dating from one of two days, but in such cases our calculations commence from the coitus of the first day only. This statistic (for the details of which we refer to the note)¹ contains 46 cases, which yield the period of 275 days as the average interval between insemination and parturition.² While 275 days was the average interval, it may be remarked that the largest number of cases at any particular day was 7 at the 274th day.

THE INTERVAL BETWEEN THE LAST MENSTRUATION AND PARTURITION

Is a period which, for obvious reasons, can be much more easily and frequently ascertained than that last under discussion. It is one, the knowledge of which is of the greatest practical importance in the every-day life of the married female, and of the obstetric practitioner, seeing that by aid of it he attempts to predict the date of the expected confinement. In the vast majority of cases, it is the only fixed point from which the calculation can be made, and hence the necessity of accurately ascertaining it, if possible.

Authors have frequently neglected the discussion of this important period, the only one available in most cases of pregnancy. They generally decide the term of pregnancy theoretically, and upon insufficient grounds, and direct that, in calculating for the

¹ Raciborski (*De la Puberté*, etc., p. 460, etc.) relates 5 cases which come within this category. The intervals were 275, 270, 268, 273, and 274 days respectively. Montgomery in his work on the signs, etc., of pregnancy, quotes or relates 7 cases. The intervals were 281, 280, 287, 289, 288, 284, and 291 days respectively. These cases differ manifestly from those of Raciborski, but this is accounted for by observing that like some of those yet to be quoted, they are selected by Montgomery as proofs of the prolongation of pregnancy in some cases. Rigby, in his *System of Midwifery* (p. 84) mentions 3 cases. The intervals were 260, 264, and 276 days respectively. Reid, in his elaborate essay on the Duration of Pregnancy ("Lancet," vol. ii., 1850), notices 25 cases. The intervals were 276, 274, 274, 275, 273, 271, 274, 274, 278, 263, 280, 264, 274, 276, 274, 276, 280, 266, 265, 266, 272, 275, 271, 287, and 293 days respectively. Besides many of those already mentioned, he adds 5 cases from the American Journal of Medical Sciences, which were 270, 272, 276, 284, 272 days respectively, and Mr Skey's case of 293 days. All the above are carefully selected cases, where the date of coitus taking place only during a single day, and the date of parturition, were accurately ascertained. They are in all 46 cases. The average interval is 275 days. More than two-thirds of the cases have an interval of 276 days or less.

² In France 270 days is the ordinarily accepted duration of pregnancy. See the Works of Jacquemier, Velpau, etc.

day of confinement, this term should be told off from some day after the last menses, which day they conceive to be that on which conception most frequently or most probably takes place. For instance, Montgomery states, upon the evidence of a very few cases only, that the natural period of human gestation is 280 days, and in calculating the date of parturition, recommends this to be added to any day within a week after the last menstruation. He thus includes between the last menses and the date of parturition a period varying from 281 to 287 days—a period which, we shall show, considerably overreaches the mark. Other authors and teachers, considering that a woman is equally liable to conceive on any day between two menstrual periods, direct that the middle day of that interval be taken, and the supposed period of gestation, 280 days, added thereto—thus including the exaggerated space of 290 to 295 days between the last menstruation and parturition.

The exact decision of this interval, as of that last under discussion, can be obtained only by a reference to actual observations. Modern researches have shown that it is at the menstrual period that the ovum quits its graafian vesicle, and traverses the fallopian tube on its way to the uterus. It is in the course of this passage that it encounters the semen, and conception results. This passage occupies about three days in the rabbit, and in M. Bischoff's opinion, it occupies eight or ten days in woman. During all this time, then, the woman will be liable to conceive. It will, therefore, be expected that the interval of which we are at present speaking, will be some days, at least, longer than the last.

The statistical calculations on this subject (for details, see foot note),¹ give on an average 278 days as the interval between the last menstruation and parturition—a period less even than the 280 days which we have generally been taught in this country to be the interval between impregnation and parturition, or the duration of pregnancy.

The largest number of cases on particular days conglomerate about the 280th. Among Dr Reid's 500 instances, 283 were within the 280 days, and 217 beyond it. So far is it, then, from 280 days being the ordinary duration of pregnancy, that a woman generally does not go more than 278 days after the last menstruation is over. This period exceeds the average interval between insemination and birth.

¹ The valuable statistics from which these results have been derived, by a tedious calculation, are published by Drs Merriman and Reid. The observations of the former were originally published in the 13th volume of the Medico-Chirurgical Transactions, and subsequently extended in the edition in 1838, of his work on Difficult Parturition. The observations of Dr Reid are to be found in the 2d volume of the "Laneet" for 1850. In Dr Simpson's paper on the Duration of Human Pregnancy, these and other allied statistics will be found carefully elaborated. See "Monthly Journal" for July 1853. In a statistic which I have made of the cases having sufficient details, recorded in the books of the Royal Maternity Hospital, a result comes out similar to that derived from the far more extensive records above mentioned.

nation and parturition by three days; and we may argue from this with some little probability, that conception takes place generally a few days after menstruation is finished—a view which is confirmed by numerous other physiological observations.

THE PREDICTION OF THE DAY OF CONFINEMENT

Is one of the functions ascribed to the *aceoueheur*; and apart from the comfort and convenience to the mother attending the foreknowledge of it, she often makes its failure or success a test of the more subtle acquirements of the physician. The foregoing statistics, however, will always justify the latter in never giving a decided prognosis of the day of confinement; and if he have been guarded and careful, will afford him asylum, showing, as they do, that with certain knowledge of the termination of the last menstruation, or even of the date of a single coitus, no safe prediction can be made unless within limits so extended as to deprive it of much of its value. At the same time, there is no doubt it will always be a desideratum to know the most probable day of confinement—and this can generally be settled with some exactness.

If the date of a single connection is ascertained, which is, of course, very rarely the case, then the process of deciding the probable day of confinement simply consists in telling off 275 days (the average interval between insemination and parturition) from that date. Now, any nine consecutive calendar months include 275 days, if February is not in the number. If February is in the number, the nine calendar months include only 273 days, and the correction necessary is apparent. The whole process of calculation, then, consists in attaching the number of the day of connection to the name of the month, ninth succeeding, and adding two additional days if February is included in the interval.¹

In the vast majority of cases, the day of confinement is predicted from the date of the termination of the last menstrual period. In many cases, the calculation can be aided and corrected by comparison with former pregnancies in the same female. But when this source of information is wanting, the nearest approach to truth will be made by adding to the day of the disappearance of the menses 278 days (the average interval between the end of menstruation and parturition). The prediction will, of course, prove erroneous in a great number, nay, in the majority of cases, but it forms the nearest approximation which the mother can obtain to guide her. If a woman, then, knows the last day of her last period, she has only to tell the same day for the ninth month following (most mothers do so on their fingers, which thus form an admirable periodoscope), and

¹ Nine months do not always contain 275 or 273 days. Dating from December and July, nine months contain 274 days, and from May 276. The statements in the text, although sufficiently correct for general use, require this correction to be exact.

add three days, or if February is in the interval, five days. She thus has the most likely day of her confinement ; or, perhaps better, she has the middle day of the week, on which she will probably be laid up.

I have already casually shown how this varies from the calculations ordinarily recommended by most British authors and teachers. It would be tedious to enter further on this subject. I may merely remark that a more correct plan prevails on the Continent. And from some inquiries and observations I have made in Scotland and England, I find that, popularly, a more correct calculation is extensively in use than that recommended in the schools. For instance, in Edinburgh, and some parts of Scotland, it is common to find women calculate in this way. They find the last day of being menstruated, and they hold that the same day nine months after will be the day of confinement. The celebrated Harvey's opinion on this subject was also very correct. His remarks tally with Dr Tyler Smith's ingenious views on this subject, and are deserving quotation :—“ Unquestionably,” says he, “ the ordinary term of utero-gestation is that which we believe was kept in the womb of his mother by our Saviour Christ, of men the most perfect; counting, viz., from the festival of the Annunciation, in the month of March, to the day of the Blessed Nativity, which we celebrate in December. Prudent matrons, calculating after this rule, as long as they note the day of the month in which the catamenia usually appear, are rarely out of their reckoning; but after ten lunar months have elapsed, fall in labour, and reap the fruit of their womb the very day on which the catamenia would have appeared had impregnation not taken place.”¹

PROTRACTION OF THE PERIOD OF PREGNANCY

Beyond the common or natural term is a phenomenon which most obstetricians are now willing to admit. But, although believing in its possibility, I am, at the same time, convinced that it is not so frequent an occurrence as late writers on this subject seem to think, and that most of the cases of this kind which are recorded have not sufficient evidence to support them. They are mostly based upon the signs of the disappearance of the menses, of the sympathetic phenomena of pregnancy, and of a physical examination of the uterus; all of which, it is needless to say, are abundantly liable to create misapprehensions and fallacious reasonings, and singly or combined can justify no absolute conclusion from them. One great reason for discrediting the evidence of most of the cases recorded by authors, is that we hear nothing of great development of the uterus, or of large size of the child or of the placenta in such cases, results which, to say the least, might be expected. On the contrary, we find such authors stating that in

¹ Harvey's Works. Willis's Transl., p. 529.

these so-called cases of protracted pregnancy the child is no bigger than usual, or is even smaller than ordinary. "Although in some of the cases of protracted gestation," says Dr Montgomery,¹ "the child was of enormous size, it by no means follows that it should be so in all such instances; and, in point of fact, we find it expressly mentioned in some of them, that the child was smaller than usual, as happened in one of Dr Hamilton's cases; and Foderé says, that in three instances in which gestation was evidently prolonged, the children were undersized and ill-thriven; while, on the other hand, the largest children are often produced where no extension of the term could have taken place." Dr Burns also says,² that "some causes which we cannot explain nor discover have the power of retarding the process (of gestation), the woman carrying the child longer than nine months; and the child, when born, being not larger than the average size." In further corroboration of these views, the valuable observations on cows and mares by Tessier and Spencer have been cited as showing that there was no marked coincidence of increase of size and weight of the foetus with protraction of gestation. But this reasoning from analogy between the cow and woman appears to be very much overstretched, and there are evident reasons for expecting, *a priori*, that the period of gestation in woman should be limited on the side of protraction more than in the lower animals. Of these the strongest is based on a consideration of the adaptation of the well-developed nine-month foetal head to the maternal passages, and the evils that are so well known to result from even slight disproportion between them. And unless it be supposed that pregnancy is protracted for the special behoof of small and ill-developed children, it must be admitted that an extraordinary development of the ovum is to be looked for in such cases. The acknowledged absence, then, of this extraordinary intra-uterine development is a strong evidence against the reality of the great mass of so-called cases of prolongation. On the other hand, the presence of this sign in addition to others is, in my opinion, powerfully corroborative of the supposed protraction in any instance. In illustration of this, I may state, that the best example I have met with of probable protraction occurred in a female who had borne several children, and who had previously always been correct in the calculation of the period of confinement from the cessation of menstruation. On the occasion in question she passed her calculated time four weeks, and before confinement expressed her conviction all the more strongly in consequence of my incredulity, that she had passed her time a month. The labour was more tedious than usual, in consequence of the great size of the foetal head. The child proved of very large size and advanced development. It weighed 10 lb. 4 oz. The placenta was 2 lb. in weight. Other cases similar to

¹ Signs and Symptoms of Pregnancy, p. 282.

² Principles of Midwifery, p. 199.

the above have been communicated to me by professional friends, and some are to be found reordred.

In these cases the ordinary sources of evidenee were eonfirmed by the evidently exaggerated development of the ova, the results of these protracted pregnaneies. I have lately had under my eare two cases in which gestation was supposed to be prolonged, but which I reject from this category, because, although the ladies were in good health at the time of falling in the family way, yet the infants born were not at all larger than their former children. The ladies were sisters, and in each of them their ealeulation and mine was passed by nearly a month. The data founded upon were the cessation of menstruation and the oecurrence of morning sickness. In both cases the respeetive nurses were residing with them for about a month before the supervention of labour.

Such eases as those of the two sisters just mentioned, and numerous other so-called cases of protraction, are easily explained by supposing simply that that menstrual flux was suppressed whieh should have oecurred about the probable time of the fruitful intercourse ; or, in other words, the decidua prepared for the ovum destined to be impregnated did not as usual throw off the bloody fluid. In these eases we must suppose either that the suppression for this one period arose from some ordinary constitutional cause, or, what is more likely, that the fruitful intercourse oecurring shortly before the ordinary menstrual period anticipated and prevented it. This phenomenon we believe not to be very rare, and to be sufficient to explain away many cases of protracted gestation. In further illustration of this circumstance, we must be satisfied with referring to those cases of pregnancy after a single coitus taking place shortly before menstruation, the coitus produeing, firstly, the partial or eomplete suppression of the menses at the approaching period, and secondly, the fertilization of the ovum diseharged in coincidence with the suppressed period. Some careful observations of this sort are reordred by Raciborski and Montgomery.

The evidence of highest value in regard to this subject which we possess is founded upon eases where pregnancy resulted from a single connection. The results of these eases go far to establish the well-founded opinion of Dr Montgomery, that the cases most deserving of confidence are those in which the usual term was not exceeded by more than three or four weeks. But the eases referred to give us the interval between insemination and parturition, a period which I have elsewhere remarked requires a correction, which physiology has not yet enabled us to decide, for the possible interval between insemination and eonception. In a practical and medico-legal point of view, however, the interval obtained is of great importance. In the collection of cases of this kind (see p. 6), the longest duration fonnd is in one ease where the period was 293 days. The other eases of protraetion will be observed by a reference to the table.

The theory of the duration of pregnaney is still unknown. Some

authors, believing that labour comes on at the tenth menstrual period, explain the protraction by the female's having a longer menstrual interval than usual, ten of which will make up a period exceeding the usual term of pregnancy. Others have supposed that from some cause a female might miss the usual period and go on to what would have been the next menstrual period, had she not been impregnated. Others have connected it with tardy development of the foetus, with the influence of depressing emotions, etc. But all these are mere hypotheses.

In conclusion we beg to state the following propositions:—

1. That the interval between conception and parturition (the real duration of pregnancy) has not been exactly ascertained in any case.
2. That the average interval between insemination and parturition (commonly called the duration of pregnancy) is 275 days.
3. That the average interval between the end of menstruation and parturition is 278 days.
4. That the intervals between insemination and parturition, and between menstruation and parturition, have no standard length, but vary within certain limits.
5. That while absolute proof of the prolongation of real pregnancy beyond its usual limits is still deficient, yet that there is evidence to establish the probability that it may be protracted beyond such limits to the extent of three or even four weeks.